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AERIAL CENSUS OF PIED CORMORANTS AT SHARKS BAY

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In response to the requests of Western Australian ornithologists interested in ecological problems in Sharks Bay, particularly the role of Pied Cormorants (*Phalacrocorax varius*) in the accumulation of the guano deposits there, I append below extracts from my logs of two flights over Sharks Bay. These flights were carried out in R.A.A.F. aircraft in connection with aerial surveys for pelagic fish which I was undertaking at the time for the Council for Scientific and Industrial Research. What I believe to be a conservative enumeration of the cormorants seen was made on two of these flights, firstly on October 9, 1945 and then again on July 25, 1946. Neither flight, of course, surveyed the cormorant population of the whole of Sharks Bay, which covers an area of about 5,000 square miles, but I consider the numbers seen were an appreciable proportion of the total cormorant population in that area. The first flight was along the eastern shore of Dirk Hartogs Island and the second covered portion of the same shoreline with, also, a section of the eastern shore of Sharks Bay and of Faure and Pelican Islands.

The number of cormorants observed during the first flight was the largest I have seen within a comparable area in Australia. The nearest approach to it, in my experience, would be the cormorant population of the Sir Joseph Banks group in Spencer Gulf, South Australia, which I first inspected from a plane in 1939. Subsequent aerial visits to that locality, however, suggest an appreciable falling off in number though there might, of course, have been possible local shifts in the concentration of the birds to account for this. It was believed in one quarter that the diminution in numbers was due to the destruction of the cormorants' eggs by Silver Gulls. The cormorants there were the Black-faced Cormorant (*Phalacrocorax fuscescens*); I have not surveyed the headwaters of the Gulfs in South Australia, where *P. varius* is stated to be the more plentiful cormorant.

Generally speaking, however, apart from the cormorants, which are usually concentrated around shorelines and islands but which I noted, on one occasion, in association with a shoal of tuna, the open expanses of Sharks Bay are, in my experience, relatively



AERIAL VIEWS OF EGG ISLAND, SHARKS BAY

Upper View: July 23, 1946, at 400ft., looking S.E.

Lower View: May 1, 1944, at 200 ft., looking S.W.

birdless. One sees a few terns, Silver Gulls and mutton-birds (*Puffinus pacificus*) and in the winter months an occasional Gannet (*Sula serrator*) but the normal scarcity of these useful indicators of pelagic fish is all the more surprising in view of the large concentrations of pilchards (*Sardinops neopilchardus*) which apparently occur in Sharks Bay. Thus on November 24 and 25, 1944 I witnessed from the air a very large aggregation of shoals of sardine-like fish in the Bay but there was scarcely a bird in attendance on them. From specimens collected later in various ways it would seem almost certain that the fish in the shoals were pilchards.

The photograph (lower view) reproduced of Egg Island, a noted deposit of cormorant guano in Sharks Bay, was taken with a Leica 35 m.m. camera on a previous flight, on May 1, 1944, when the accumulation of guano appeared considerable. On July 23, 1946, when I again observed the island, I took the second photograph (upper view) and made the following record in my log: "Only about 200 Cormorants on the island which has not nearly so much guano on it as previously."

During the course of my aerial surveys close attention has been paid to the distribution of seabirds and actual counts of small flocks (especially of gannets) have frequently been made. It is possible from the air to make an accurate count of the number of birds in small flocks and, with experience, quite close estimates of the numbers in reasonably small flocks can be made almost instantaneously. In all cases where the birds could not actually be counted my estimates, I believe, were conservative.

Extracts from Flight Logs

October 9, 1945: During flight from Carnarvon to Geraldton and referring to the whole of the eastern shore of Dirk Hartogs Island; average altitude 400 feet. The census of cormorants is from north to south along the island:

1202 hours: Cape Levillain. About 1,000 cormorants were roosting on the beach and some were in the water nearby about a mile south of Cape Levillain. Wind S.S.E., about 20-25 miles an hour.

A few miles further south another flock of cormorants; fully 1,000 and probably 1,500.

A little later another flock of about 200; then about 150 Crested Terns. One or two Pacific Gulls and a few Silver Gulls.

North of Withnell Point: About 40 sharks about 5-6 feet long patrolling the beach within a few feet of the shore. Two more flocks of cormorants, about 200 in each. Then a flock of about 300 Crested Terns. Quoin Bluff is about 15 miles south. The water is somewhat "milky" on shore.

Five flocks of cormorants totalling about 800-1,000. One flock of about 300 Crested Terns.

1217 hours: The Quoin Bluff is about six miles south. There are occasional small groups of cormorants ranging from six to twelve in each. I think I have seen already certainly 4,000 and probably 5,000 to 6,000 cormorants.

1230 hours: Leaving the cormorant roosts about 4 miles north of Quoin Bluff after photographing the birds. Here are fully 10,000 cormorants. Some are on the cliffs and some are in the water nearby.

Tetrodon or Egg Island. There were about 300 cormorants, six Pelicans and a few Crested Terns here. There were also about 200 cormorants on Quoin Bluff. I think it is safe to say there are 15,000 to 20,000 cormorants between Cape Levillain and Egg Island.

A mile south of Egg Island—another 300 cormorants . . .

1250 hours: Over the south Passage to Sharks Bay at the southern end of Dirk Hartogs Island. I have seen about 500 cormorants between Dirk Hartogs homestead (which is 6-7 miles north) and this point. These birds were in several flocks and are additional to those mentioned previously. Wind S.E., about 25 miles an hour. Very bumpy. Sky clear.

July 25, 1946: During flight from Carnarvon to Guildford; the extract deals with the section of it from Carnarvon to Bibra Landing, thence across to Pelican and Faure Island and Denham and thence to a point about 14 nautical miles south of Cape Levillain thence southwards along the remainder of the eastern shore of Dirk Hartogs Island. Average altitude, 400 feet.

0955 hours: Off Carnarvon for Perth. Cloud 1/10. Wind, S.E., about 15 miles an hour. Flying down eastern shore of Sharks Bay to Gladstone, near Bibra Landing, approximately Lat. 25° 54' S.

1015 hours: Eight pelicans, 100 Pied Cormorants and about 100 Crested Terns on a sandspit. It is, apparently, high tide.

1020 hours: Five Pelicans, 150 cormorants and about 12 Fairy Terns.

1022 hours: Nine Pelicans, 100 cormorants. All these are on the shore. We are following the shore down to Gladstone.

1029 hours: 100 cormorants.

1032 hours: Three Pelicans and one Pacific Gull.

1036 hours: We are now near Wooramel River. Since 1035 we have seen three groups of Pelicans, comprising 22, 2 and 10 birds respectively. Also a few Silver Gulls.

1040 hours: Over Yaringa North homestead. Wind E.S.E., about 20 miles an hour. Cloud 0/10. Bound for Pelican Island. There is a jetty about due west of Yaringa North homestead. It is probably identical with Bibra Landing. On Pelican Island I observed 800 cormorants, 150 Crested Terns, 150 Silver Gulls and 8 Pied Oyster-catchers. There is evidence that this island is much used by birds, at least for roosting and probably for nesting. There were no cormorant nests visible.

1055 hours: Over Faure Island. This presents much the same appearance as the Peron Peninsula country. In the north-eastern portion of the island I saw two groups of cormorants in the mangroves, of 80 and 400 birds respectively, but I believe there was a much bigger population of cormorants present. There were some Pied Oyster-catchers here also and a few White-faced Herons. I noticed also a few sheep. We are turning and going south. We flew

around about half the island at an altitude of about 50 feet. The mangroves are on the north-east, north and north-west portions of the island.

1103 hours: Bound for Denham.

1125 hours: Our position is Lat. 25° 43' s. (about 14 nautical miles south of Cape Levillain) on the east coast of Dirk Hartogs Island after a flight from Denham. We are now about to fly southwards along the east coast of Dirk Hartogs Island for an inspection of the cormorant population. At the present position there are 200 cormorants.

The cormorants roosting at about 7 to 8 miles north of Quoin Bluff were photographed. There were obviously some thousands of birds present, probably 7,000 to 10,000 birds. They showed little inclination to leave the roosts but eventually about 1,500 flew on to the nearby water. There were only about 50 cormorants at the Quoin Bluff. . . . There were only about 100 Crested Terns and Silver Gulls on Egg or Tetrodon Island.

1145 hours: Wind S.E. about 15-20 miles an hour. Sky clear. Crossed South Passage to Sharks Bay to the open sea.

UNUSUAL NESTING SITE FOR A COLONY OF CRESTED TERNS

By H. O. WEBSTER, Government School, Rosa Brook.

On December 21, 1946, I was visiting Hamelin Bay, near Karridale, Western Australia and on going down to the beach, I noticed numbers of terns flying back and forth from the broken part of the old jetty. The terns were Crested Terns (*Sterna bergii*) and appeared to be in considerable numbers. I had often seen these birds in this locality before but only in small numbers, so that my curiosity was aroused. At the first opportunity I went out to see what the unusual activity was about.

I found that a nesting colony had been established there, actually on the old jetty, since my last visit in January, 1946. To my certain knowledge Crested Terns had not nested there in the previous nine years, probably never before in the same place. The jetty is over forty years old and was built so that timber cut at the several mills near Karridale in those days, could be shipped overseas. It is gradually falling to pieces from old age, disuse and neglect, only two sections of any size remaining. The first of these sections extends from the shore westwards some fifty yards. There is then a gap of about thirty yards. The second part then continues for approximately one hundred yards out to sea. This section thus forms a sort of wooden island, one hundred yards long and twenty yards wide. As may be seen in the accompanying photograph, the decking timbers lie about in confusion while the beams and piles are much decayed.

The only means of reaching the colony was by rowing boat, so on the first suitable day I spent some hours with the birds. It was a most interesting experience and I quickly realised how deafening the noise in a large colony of birds must be. I made